What is claimed is:

1. A method of forming a shallow trench isolation, comprising steps of:

forming a plurality of trenches in a semiconductor substrate;

forming an oxide liner on the bottom and sidewall of each trench; and

thermal annealing in a nitrogen-containing atmosphere to dope nitrogen elements in the oxide liner, wherein a nitrogen-rich layer is formed at the interface between the oxide liner and the semiconductor substrate.

2. The method according to claim 1, wherein the nitrogen-containing atmosphere comprises N_2, NH_3, N_2O, nitric oxide or any nitrogen-containing compound.

3. The method according to claim 1, wherein the thermal annealing is performed at 650~850℃, 100~250 mtorr, for 1~30 minutes.

4. The method according to claim 1, wherein the oxide liner is formed by thermal oxidation.

5. The method according to claim 1, wherein the trenches are formed by anisotropical dry etch.

6. The method according to claim 1, further comprising steps of:

depositing an insulating layer on the entire surface of

the semiconductor substrate to fill the trenches; and

using chemical mechanical polishing (CMP) to planarize the insulating layer to reach the top of the semiconductor substrate.